

I Claim:

1. An apparatus for fabricating a fiber reinforced plastic part, comprising:
an extrusion head,
wherein said extrusion head further comprises an orifice;
means for moving said extrusion head in a controlled pattern;
means for regulating the speed of extrusion from said extrusion head;
a resin impregnator;
a supply of fiber reinforcement,
wherein said fiber reinforcement passes through said impregnator and
through
said orifice of said extrusion head;
a supply of radiation-initiated resin for impregnating said fiber reinforcement;
means for feeding said fiber reinforcement to said impregnator;
means for impregnating said fiber reinforcement with said resin;
a radiation source; and
a readable definition of said part.
2. The apparatus according to Claim 1, wherein said means for moving said head in a controlled pattern comprises a computer numerically controlled machine.
3. The apparatus according to Claim 1, wherein said means for moving said head in a controlled pattern comprises a mechanically guided machine.

4. The apparatus according to Claim 1, wherein said means for regulating the speed of extrusion from said extrusion head comprises a computer numerically controlled machine.

5. The apparatus according to Claim 1, wherein said means for regulating the speed of extrusion from said extrusion head comprises a mechanically guided machine.

6. The apparatus according to Claim 1, wherein said fiber reinforcement comprises a yarn.

7. The apparatus according to Claim 1, wherein said fiber reinforcement comprises a ribbon.

8. The apparatus according to Claim 1, wherein said fiber reinforcement comprises a tube.

9. The apparatus according to Claim 1, wherein said resin cures and hardens with exposure to ultraviolet light.

10. The apparatus according to Claim 1, wherein said radiation source comprises ultraviolet light in a wavelength range between about 380 and 400 nanometers.

11. The apparatus according to Claim 9, wherein said radiation source further comprises about 400 to 1000 watts of ultraviolet light.

12. The apparatus according to Claim 1, further comprising a lens and mirror for directing said radiation source to said extruding fibers reinforcement.

13. The apparatus according to Claim 1, wherein said means for feeding said fibers reinforcement to said extrusion head comprises one or more of a supply roller, a tensioner, and a roller pair.

14. The apparatus according to Claim 1, wherein said means for impregnating said fiber reinforcement with said resin comprises a resin supply line and a pump.

15. The apparatus according to Claim 1, wherein said readable definition of said part comprises a mechanical definition of said part.

16. The apparatus according to Claim 1, wherein said readable definition of said part comprises a computer-generated definition of said part.

17. The apparatus according to Claim 1, further comprising means for spraying said fabricated part with surfacing materials.

18. The apparatus according to Claim 17, further comprising means for cutting or abrading said sprayed part back to the final dimensions of said readable definition of said part.

19. An apparatus for fabricating a fiber reinforced plastic part, comprising:
an extrusion head,
wherein said extrusion head further comprises an orifice;
a computer numerically controlled machine to which said extrusion head is mounted;
a resin impregnator;
a supply of fiber reinforcement,
wherein said fiber reinforcement passes through said impregnator and
through
said orifice of said extrusion head;
a supply of resin for impregnating said fiber reinforcement;
means for feeding said fiber reinforcement to said extrusion head;
means for impregnating said fiber reinforcement with said resin;

a radiation source; and

a readable definition of said part.

20. An apparatus for fabricating a fiber reinforced plastic part, comprising:

an extrusion head,

wherein said extrusion head further comprises an orifice;

a mechanically guided machine to which said extrusion head is mounted;

a resin impregnator;

a supply of fiber reinforcement,

wherein said fiber reinforcement passes through said impregnator and

through

said orifice of said extrusion head;

a supply of resin for impregnating said fiber reinforcement;

means for feeding said fiber reinforcement to said extrusion head;

means for impregnating said fiber reinforcement with said resin;

a radiation source; and

a readable definition of said part.

21. A method for fabricating an fiber reinforced plastic part, comprising the steps

of:

programming a readable definition of a part into a machine,

wherein the machine moves an extrusion head mounted to the machine in a controlled pattern; and

wherein the machine regulates the speed of extrusion from the extrusion head;

feeding the fiber reinforcement to the extrusion head of the machine; impregnating the fiber reinforcement with a radiation-initiated resin; extruding the impregnated fiber reinforcement from an orifice in the extrusion head; and exposing the extruded fiber reinforcement to curing radiation.

22. The method according to Claim 21, wherein the step of extruding the fiber reinforcement comprises extruding the impregnated fiber reinforcement at a speed consistent to the speed of travel of the extrusion head.
23. The method according to Claim 21, wherein the step of extruding the fiber reinforcement further comprises moving the extrusion head with the machine along a path that defines the surface of the part.
24. The method according to Claim 21, wherein the step of extruding the fiber reinforcement further comprises extruding a plurality of points of attachment to a base or support structure at intervals during the extrusion.
25. The method according to Claim 21, wherein the step of exposing the extruded fiber reinforcement to curing radiation further comprises coordinating the rate of cure with the rate of travel of the extrusion head and the rate of extrusion of the fiber reinforcement, thereby maintaining the fiber reinforcement in position at the point of extrusion.
26. The method according to Claim 21, wherein the step of extruding the fiber reinforcement further comprises the step of rotating the extrusion head, which is mounted to an arm of the machine, and free-forming the shape of extruding fiber reinforcement onto a take-away belt.

27. The method according to Claim 21, further comprising the steps of:
spraying the laminated part with surfacing materials; and
cutting or abrading the sprayed part back to the final dimensions of the original
definition of the part.